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SUBJECT: BULGARIAN BIOFUEL INDUSTRY

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¶1. SUMMARY: The Bulgarian biofuels industry is just getting off the ground. Biodiesel and bioethanol (see Definitions at bottom) are currently produced only in small quantities, although an increasing number of investors are constructing facilities for production of biofuels, mainly biodiesel. Local biofuel production should reach 350,000 MT within the next two years. Constraints to production and trade include a lack of access to capital; lack of clear GOB regulations and support; a limited local market; and lack of appropriate infrastructure investment to facilitate trade by other market players (refineries, storage houses and retail distributors). The GOB is in the process of drafting EU-harmonized legislation and expects to have a regulatory framework in place by end-¶2006. However, the industry faces challenges related to official concern about reduced budget revenue, and a still-significant gray market in oil and distilled spirits. Recent political scandals involving smuggled oil, gray duty-free zones for petroleum imports, and the traditionally questionable distilled spirits trade are contributing to the shaky business environment.
END SUMMARY.

Raw materials for biodiesel and bioethanol

Biodiesel

¶2. Currently, investors in the Bulgarian biofuels sector generally view biodiesel as a more attractive option than bioethanol, for the following reasons:

- Strong demand for biodiesel in the EU and attractive profit margins;
- Relatively less start-up capital needed to build a biodiesel facility;
- Existing regulations which call for no excise tax on biodiesel.

¶3. The current major constraint for biodiesel investors is the lack of raw material. Suitable for production in Bulgaria are (in order of best to worst) sunflower seeds, rapeseed, and soybeans.

¶4. Sunflower seeds are traditionally exported in large volumes to the regional market, especially Turkey. MY2006/2007 sunflower production is likely to reach over 950,000 MT. However, according to industry sources, sunflower biodiesel is not in high demand due to its lower quality compared to rapeseed biodiesel, and because currently it does not meet EU biodiesel standards. In addition, the industry indicates that sunflower diesel, as it is produced currently, can be

used only during the summer, making large-volume commercial use unlikely.

¶15. According to managers in the biofuels sector, Bulgaria will need at least 600,000 MT of oilseeds for biodiesel production in the next 2-3 years (see the list of current investment projects in para 27). In addition to these larger projects, reportedly, there are a number of very small installations producing biodiesel at various farms. They process used vegetable oils into biodiesel for farm vehicles. The volume and quality of this biodiesel limits its suitability to on-farm use. FAS Office of Agricultural Affairs estimates that this production does not exceed 1,000 MT/year.

¶16. Bulgaria is not a traditional producer of rapeseed. The rapeseed crop in 2006 is likely to be 33,000 MT, a 51% increase over 2005 but still significantly below the capacity of facilities which are being constructed. Larger farmers are willing to increase rapeseed area in the near future; however, the crop is vulnerable to frequent winter cold spells and summer dryness, and is less well-suited than sunflower to production in Bulgaria. Currently, several German companies are offering farmers rapeseed seeds (96 Euro per a bag for seeds to plant 3.0 HA) in return for purchasing the crop at a fixed ex-farm price of 400 leva/MT (USD 263/MT), which is very attractive to farmers. According to FAS estimates, rapeseed production should double in the near future to 60,000 MT. However, the volume of rapeseed production will remain far below what is needed to meet local demand for biodiesel feed stocks.

¶17. Soybeans are not a particularly good alternative due to Bulgaria's relatively dry climate and lack of irrigation. Annual production over the last several years has not exceeded 4,000 MT.

¶18. If the Bulgarian agricultural sector is not able to satisfy demand for agricultural feedstocks for biodiesel, it is likely that biodiesel manufacturers will import crude vegetable oil for processing. Finally, depending on relative prices and supply uncertainties, it is expected that some manufacturers will import pure, ready-to-mix biodiesel.

Bioethanol

¶19. Bulgarian wheat and corn production have traditionally exceeded domestic consumption. In very dry years corn production suffers, but supply is usually sufficient to meet local demand. On average, Bulgaria exports about 1.0 MMT of wheat and 100,000 MT to 400,000 MT of corn annually. Exported wheat and corn tend to be of relatively lower quality, suitable for industrial use. Prices are competitive. These are the primary advantages to using wheat and corn to expand in bioethanol manufacturing. As with biodiesel production, however, it is still unclear if locally-produced ethanol will be more competitive than imported ethanol.

¶10. A significant disadvantage facing all local biofuels operations is their relative inefficiency and small size. For bioethanol production, for example, local industry estimates show corn and wheat conversion rates (grains into ethanol) at 3.4-3.8, compared to around 2.0 for most U.S. bioethanol plants.

¶11. We estimate that in 2007 total Bulgarian consumption of biofuels (biodiesel and bioethanol) will be 150,000 MT. Taken together, production from all current and short-term investment capacity (in the next 2-3 years) should amount to 350,000 MT of biofuels, substantially exceeding local market demand. All managers in the biofuel industry are expecting to export at least 80% of their final product to the EU.

¶12. Commercial demand in Bulgaria for biodiesel and bioethanol is limited to one major buyer, the Russian company LukOil, on the Black Sea port of Bourgas. The LukOil refinery in Bourgas is the only refinery in Bulgaria, and has good technology for mixing petroleum products with biodiesel and/or bioethanol.

¶13. The other major player, which is the country's largest oil distributor, Petrol, imports oil, diesel, and propane and distributes these fuels via its own distribution and retail network. These two companies together have 539 retail gas stations in Bulgaria.

¶14. There are at least 20 other companies which independently import and trade smaller volumes of oil and diesel. Some of them have their own distribution networks, and some sell to other distributors. Aside from LukOil and Petrol, other major distributors are OMV, Shell, and Opet. These companies buy regular petroleum-based fuels from LukOil or Petrol, or import on their own.

¶15. Some of these companies have the technical ability to mix biofuels with petroleum products at their storage warehouses. Currently, however, there are only a few gas stations in Bulgaria equipped for retail sales of mixed fuels. Although the number in Sofia is growing, GOB sources indicate that the oil industry will welcome increased use of biofuels in Bulgaria if clear and transparent regulations are written and enforced. Reportedly, the oil industry prefers to see government regulations which give preferences to mixtures of up to 5 percent biofuels, rather than to pure biofuels. Currently there are no flex-engine vehicles in the country.

¶16. Bulgarian biofuel prices are lower than EU prices due to different excise duties and to other regulations. The average price of biodiesel in the EU is Euro 1.07/liter, about 10% less than the price of petroleum diesel at 1.18 Euro/liter. In Bulgaria, the few stations selling biodiesel are charging Euro 0.75-0.86/liter, which is about 7% lower than the price of petroleum diesel at Euro 0.91/liter.

¶17. Bulgarian retail biodiesel prices are therefore about 20% below EU retail prices. The lower Bulgarian prices appear to reflect production costs fairly accurately, since the subsidies and other preferences provided to EU farmers and refiners are largely unavailable to Bulgarian producers.

Agricultural feedstocks: Biomass

¶18. Currently, no Bulgarian manufacturer uses biomass from field crops to produce fuel. Local farmers still burn fields after the harvest to destroy stalks and straw in order to reduce fuel expenses for farm equipment. Recent local research shows that 30 percent of local wheat straw, 65 percent of corn stalks and 80 percent of sunflower stalks and shells could be used for energy production.

¶19. The Bulgarian rural population traditionally uses biomass - firewood and coal - for heating. In 2003, energy produced from biomass was 7.4% of total energy consumption. Biomass energy output for the same period was 3 times more than the production of hydroelectric energy. The major consumer of biomass energy was the population (86%) vs. industry (14%). For the period 1997-2004, biomass used by the population has increased 3.4 times while consumption of all other types of energy and oils has stagnated. Further expansion in new biomass sources for energy production will be well received by consumers. Currently, a few foreign investment funds are active in Bulgaria, and at least two American firms are looking

at investing in biomass facilities on the coast. However, the new technology is still unaffordable for most local businesses and no serious prospects for affordable solutions are visible over the next few years.

Government regulations

¶20. Although the biofuels phenomenon is the subject of lively debate among investors, farmers, processors, traders, and oil companies, public information about this market is scarce. No written policies, action plans, studies, data, or other materials about the biofuels industry have been made available by the GOB. Information about market developments in this unregulated sector is disseminated informally rather than via transparent interactions between buyers, sellers and regulators.

¶21. In mid-2006, the GOB accelerated its work on harmonization of EU legislation and started drafting the Renewable Energy Sources Law (RESL) and implementing regulations (reftel). Most likely, the law will be passed by the Bulgarian Parliament in October, followed by the regulations which are likely to be approved in November. The GOB's goal is to have the necessary legislation in place by the end of this year.

¶22. According to the Bulgarian EU Accession Treaty and harmonized local legislation, the share of biofuels in domestic fuel consumption should reach 5.75 percent by 2010, and 20 percent by 2020 (EU Directive 2003/30). The draft RESL is likely to introduce mandatory 5 percent use of biofuel in 2007. The requirements will cover national annual biofuel consumption, and will not specify the type of fuel (biodiesel, bioethanol) to be used. For now, regulations will treat all biofuels equally and will not seek to favor one over the other. Reductions or re-ordering of excise duties will be the major policy tool. It is expected that excise duties will be graduated, and that 5 percent content biofuel will be subject to the lowest duty.

¶23. Biodiesel was exempted from excise duties in July 2006 (official gazette 391 (art.32), of November 15, 2006, in effect since July 1, 2006). However, this regulation applies only when pure biodiesel is sold. Excise tax is currently applied when biodiesel is mixed with petroleum.

¶24. Excise tax exemptions for bioethanol were approved by the Budget Commission of the Parliament as a part of the latest revision of the Excise Tax Act on August 3, 2006, but the revised law has not been entirely passed yet. So far the GOB has been reluctant to accept reduced tax receipts by offering the industry fiscal incentives.

¶25. Another challenge for local biofuel manufacturers is the current treatment of biofuel as an "excise tax product" even though the excise tax is zero. This designation means that biofuel can be produced only at a "licensed excise storage/warehouse." Such licensing requires that a company have registered capital of 500,000 leva (USD 333,000) (art.47/1, Excise Law), an amount unaffordable for small and medium farmers. In addition, the Ministry of Environment has the authority to grant special permission to biofuel producers under regulations for waste management; this process usually takes about a year and a half, during which the company cannot operate. A third challenge to local producers is presented by competition from informal imports of some biofuels. Lack of transparent supply arrangements and tough pricing tend to reduce incentives to produce locally.

¶26. Currently, there are four Bulgarian associations of biofuel producers. Some of these associations have representatives on the working groups under the Ministry of Economy that are drafting the RESL. However, there is some concern that they do not actually represent the most significant players on the market.

Investment support

¶27. There are several state and private programs which provide various types of support for development of bioenergy projects. Among these are:

- European Bank for Reconstruction and Development: credit lines to 5 local commercial banks for energy efficiency and renewable energy projects;
 - Bulgaria Ministry of Environment via its Enterprise for Environment Management;
 - EU-SAPARD investment program, with 21 projects for biofuels which have been approved and are in process of implementation;
 - Bulgarian National EcoFund;
 - Dutch Government program (PSO) for investment in eco-energy projects;
 - EU-Nordik Funds;
 - Bulgarian Government Energy Efficiency Fund.
- According to preliminary GOB information, it is likely that this fund will start giving soft loans to biofuel producers after the RESL is passed.

Expected effects on the agricultural market

¶28. The growing European market for biofuels will spur significant changes in traditional agricultural production patterns in Bulgaria. Within the next three years, FAS/Sofia expects to see the following changes:

- Corn: Corn area and production should increase to about 2.0 MMT. More changes are expected in corn production than in any other area. Over the next two years, EU demand for price-competitive Bulgarian ethanol from corn is expected to be strong. Expansion in planted areas is likely to come from currently idle agricultural land, or from reduced wheat acreage, mainly in Northern Bulgaria. Irrigation is likely to be tried for the first time.
- Rapeseed: Bulgarian farmers may also expand areas under rapeseed. Total additional area will not be large due to the climate and other limitations. However, good prices are likely motivate large farmers to start planting more rapeseed in the fall of 2006. Production should rise to 50,000 MT-60,000 MT, or double the current volume. Growth in rapeseed area may come with reductions in wheat or, more rarely, in sunflower area.
- Sunflowers: If producers are offered attractive prices, a portion of sunflower exports will be converted to local biodiesel production. However, the proximity of the huge Turkish market with its enormous demand for vegetable oil, and the easy access that small and medium suppliers have to foreign buyers, will present supply challenges to local biofuels processors, especially in Southern Bulgaria.

¶29. Despite expected increases in local supplies for processing of sunflower and rapeseed into biodiesel, imports of supplementary stocks and alternative raw

materials are inevitable. Crude sunflower oil, rapeseeds, soybeans, soy and palm oil are the most likely feedstocks for import into Bulgaria. Better opportunities exist for those buyers who are located on the Danube or Black Sea ports and have cheaper access to sea/river shipments.

¶30. In the future, bioethanol may prove to be a better solution for local agriculture compared to biodiesel - the opposite of the current situation. Bulgarian farmers tend to produce higher volumes of lower quality grains which do not meet EU quality standards for intervention stocks but are appropriate for industrial use. Due to relatively frequent dry years and lack of irrigation, wheat is the most stable local crop and the only one which can provide steady and abundant supply. As technology improves, bioenergy producers' demand for Bulgarian corn, sunflower, wheat should put some upward pressure on prices and contribute to improved farm incomes.

Definitions

¶31. Biodiesel: a clean-burning alternative fuel produced from fats or oils. Biodiesel contains no petroleum, but it can be blended at any level with petroleum diesel to create biodiesel blend. It is biodegradable, nontoxic, and essentially free of sulfur and aromatics. It is typically produced by a reaction of a vegetable oil or animal fat with an alcohol such as methanol or ethanol in the presence of a catalyst to yield mono-alkyl esters and glycerin, which is removed. Biodiesel can be used in compression-ignition (diesel) engines with no major modifications.

¶32. Bioethanol: Basically alcohol, bioethanol is made from starch plants (grain, corn, wheat, and tubers like cassava); or sugar (sugar beet or sugar cane). Research into bioethanol from cellulose plants (e.g. trees) is still in an early stage. Bioethanol is obtained using fermentation and enrichment by distillation/rectification and dehydration. Ethanol or ethyl alcohol (C₂H₅OH) is a clear colorless liquid, which is biodegradable and low in toxicity, and causes little environmental pollution if spilt. Ethanol burns to produce carbon dioxide and water. Ethanol is a high octane fuel and has replaced lead as an octane enhancer in petrol. Blending ethanol oxygenates the fuel mixture so it burns more completely and reduces polluting emissions. Ethanol fuel blends are widely sold. The most common blend is 10% ethanol and 90% petrol (E10). Vehicle engines require no modifications to run on E10 and vehicle warranties are unaffected also. Only flexible fuel vehicles can run on up to 85% ethanol and 15% petrol blends (E85).

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